

## COMMON INDIAN SPIDERS.

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(With five plates.)

Spiders are among the most ubiquitous creatures in India, and seem everywhere to have an evil, but so far as I have been able to ascertain quite unproved, reputation as the cause of the painful sore popularly called a "spider-lick". It is surprising therefore to find how little is really known about them and their varied and interesting habits.

The order is divided into two suborders: (1) the Araneae Theraphosæ or Mygalomorphæ characterised (*a*) by jaws which project straight forwards, the fang of each folding straight backwards along its under side and (*b*) by two pairs of conspicuous slit-like stigmata or openings into four corresponding lung-sacs in the anterior part of the ventral surface of the abdomen; and (2) the Araneae Vereæ or Arachnomorphæ characterised (*a*) by jaws which project vertically or obliquely downwards, the fang of each folding along its inner or hinder side and (*b*) by one instead of two pairs of more or less conspicuous pulmonary stigmata, and either one or two stigmata, usually not very evident, opening into tracheal breathing tubes.

The former suborder includes the massive hairy spiders, generally known as Tarantulas, and a number of smaller forms allied to them, such as the Trap-door-spiders. The latter suborder is much the more extensive of the two and includes all the rest. The so-called Harvest-Spiders (order Phalangidea=Opiliones) and Camel Spiders or Jerrymungalums (order Solifugæ=Solpugæ) are not true spiders at all since, among other differences, there is no clearly marked division between the cephalothorax and abdomen in the former, and in the latter the jaws are of a different type from those of true spiders.

The large Mygalomorph spiders, commonly known as Tarantulas, are much more massive than any others, though several groups contain species having about the same span. Most of them live in holes in the ground lined with silk, from which they emerge at night to catch their prey. The genus *Poecilotheria*, however, which is confined to India and Ceylon, lives in trees.

All spiders possess a pair of poison-glands, opening near the tip of the fangs, but few seem to have the power of injecting their poison into human beings. It is probable, moreover, that the poison is not automatically ejected whenever the fangs are used, but is under the spider's control. That the popular dread of a Tarantula bite is to a considerable extent justified is proved by the following observation, communicated to me by Dr. Sutherland of Kalimpong. "A boy of 14 years was bitten by this spider [a well grown female of *Macrothele vidua*] on the finger. The pain extended up the arm and down the side. After 24 hours the finger was still swollen". The spider only bites on great provocation, however, and this was the first instance that Dr. Sutherland had known, although the boys in his school frequently kept specimens in captivity. Mr. R. S. Lister, on the other hand, suffered no ill effects beyond a slight local swelling when bitten by a fine specimen of the much larger species *Chilobrachys fumosus*. This may have been due to the fact that we had been making the specimen very angry beforehand, in order to hear the faint rattling sound which is produced as it strikes; and it is possible that it had uselessly emptied its poison-glands before the bite was given, drops having been seen exuding from the tips of the fangs.

The sound-producing organs of these spiders consist of specialised teeth or spines on the opposed surfaces of the basal joints of the chelicerae and palps, but they are not present in all genera. They were first discovered in *Chilobrachys* ('*Mygale*') *stridulans*, which is said to make a noise that "is both peculiar and loud; it resembles that made by pouring out small shot on to a plate from a height of a few inches, or, better still, by drawing the back of a knife along the edge of a strong comb". While stridulating "the spider usually rested on the four posterior legs, raising the other four and shaking them in the air, with the thorax thrown up almost at right angles to the abdomen and the chelicerae in rapid motion—assumed in fact, quite a threatening attitude" (*Trans Ent. Soc. London*, 1877, pp. 281-2, pl. VII; pl. reproduced as fig. 1 of present paper). It is interesting to note that the sound produced by *C. stridulans* is much louder than that made by *C. fumosus*, as the stridulating organs of the former are of more highly specialised structure than are those of the latter.

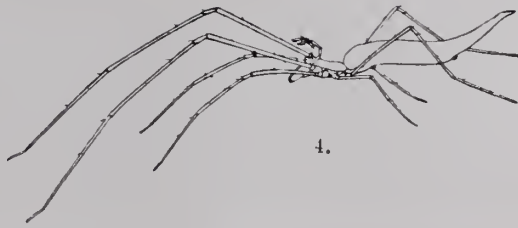
The Trapdoor-spiders belong to two distinct subfamilies, the *Ctenizinae* and the *Barychelinae*, but not all species of these subfamilies close the mouths of their abodes with trapdoors. So far as my observations go, the abodes of the *Ctenizidae* are more or less elongated burrows with a single opening each, whereas those of the *Barychelinae* are shorter and broader with two apertures (see fig. 2). The burrows of some of the *Ctenizidae* (e.g., *Nemesiellus montanus*) are, however, forked near the bottom with an internal trapdoor at the fork which can be pulled across so as to shut off whichever branch the spider chooses to hide in (fig. 2a). The trapdoors may be thin and "wafer" like falling over the aperture they have to hide; or they may be stout and "cork" like, fitting tightly into the aperture. In either case they are difficult to detect, being composed of silk covered on the outer surface with soil, etc.; but whereas in the former case there is only one layer of silk, in the latter a number of layers are united one on top of another.

Males have to leave their nests in search of mates, but with this exception these spiders probably never go out except through misadventure, resting on the inner side of the trapdoor till a fly alights on the outer side, when the door opens and the fly disappears with lightning rapidity. If a specimen is removed from its nest it appears to have no knowledge as to how to make a new one unless it is provided with some sort of burrow to start with, in which case this will be provided with a trapdoor, enlarged if necessary, and lined with silk. Otherwise the spider wanders about until after a day or two it dies, without attempting to make a new burrow for itself.

Further observations on the habits and nests of various species of Trapdoor-spider are much to be desired. All the species so far described have been Mygalomorphs belonging to one or other of the two above mentioned subfamilies; but in Madras there is a species belonging apparently to the Arachnomorph family *Zodariidae* which likewise closes the entrances to its nest with trapdoors.

The Araneae Verae or Arachnomorphae can be divided into two groups, the *Cribellateae* and *Ecribellatae*, according to whether a cribellum or spinning plate is present or not in front of the spinnerettes; and this classification is commonly adopted, though it is by no means certain that it is a natural one, since certain *Cribellate* families appear in other respects to be more closely related to different *Ecribellate* families than to each other.

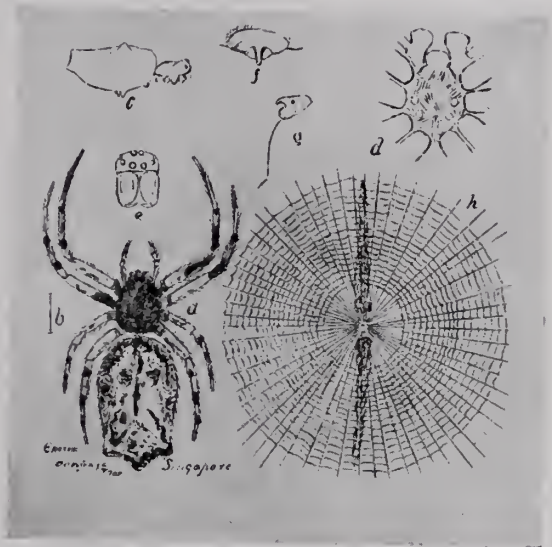
*Stegodyphus sarasinorum* (Fam. Eresidae), a common social spider widely distributed throughout India, is among the most interesting of the *Cribellateae*. It spins dense untidy cobwebs among the branches of trees and bushes, each of these being as a rule the home of a large number of spiders (fig. 3). From these nests sheets of very sticky and elastic silk extend outwards, and woe betide any insect unwary enough to fall into one of them. For immediately the spiders find that anything has been caught they swarm out and together drag it



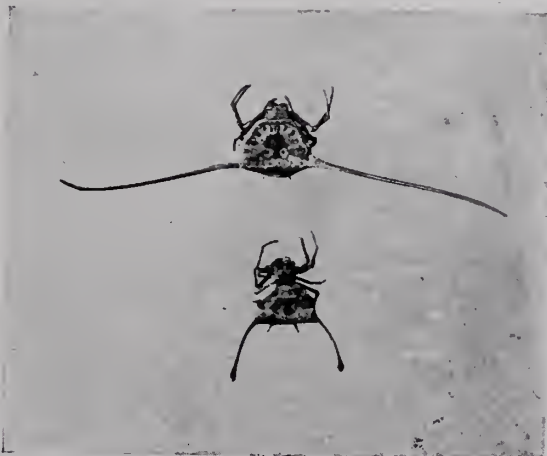
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4. *Eucta javana*.

5. *Nephila maculata* ♂ (above) and ♀ (below) both same scale, about  $\frac{1}{3}$  natural size.

6. *Cyclosa confraga*: (a) Spider, (b) about  $\frac{2}{3}$  natural size; (c) Profile; (d) Sternum and bases of legs; (e) Eyes; (f) Vulva; (g) Do. profile; (h) Web (reduced). (From Workman's "Malaysian Spiders").

7. *Gasteracantha arcuata* (above) and *G. remifera* (below).





to the nest where it is devoured. The nests consequently come to be filled with the dried remains of various insects and often afford a useful clue to the entomology of the locality, including night flying forms such as readily escape notice by day. Further references to the habits of this species, as well as to the different kinds of silk used to give these webs their special characteristics will be found in *Rec. Ind. Mus.* XI, 1915, pp. 534-536, pl. XXV.

Some of the *Dictynidae*, another cribellate family, also spin their webs among foliage, but live in them singly.

The *Psecruridae* include certain large spiders with long slender legs which are abundant in damp jungles such as those on the lower slopes of the Darjeeling Hills and the Western Ghats. They spin a somewhat irregular sheet-like web which extends forward from a tubular lair. When lying in wait for their prey the spiders rest upside down on the under side of their sheets.

The *Uloboridae*, alone among the *Cribellatae*, spin circular snares constructed on a definite geometrical plan with regular radii, like the webs characteristic of the *Argiopidae* among the *Ecribellatae*. Several small species are commonly found in association with the webs of other spiders. A somewhat larger one, *Uloborus geniculatus*, frequents outhouses, etc., where it spins a web with a very characteristic lace-like centre; and yet others spin two horizontal webs, one above the other, the upper one flat and of moderately fine mesh and the lower one funnel-shaped and of much more open mesh.

The majority of spiders with circular snares belong, however, to the family *Argiopidae*, which comprises a large number of species of very varied appearance. The habits of several Indian species are carefully recorded in Hingston's fascinating book "A Naturalist in Himalaya".

The genus *Tetragnatha* includes most of the spiders with long slender bodies and strongly divaricate slender jaws, which spin webs among vegetation around water, but leave them empty by day while they sit on a neighbouring twig or blade of grass, coming out into them at dusk. Other species live among bushes in the jungle, and one at least of these, *T. gracilis*, often spins its web with the twig on which it rests extending right across the centre. The genus *Eucta* (fig. 4), also very abundant near water, differs from *Tetragnatha* only in having the abdomen produced beyond the spinnerettes into a pointed tail. To the same subfamily belongs *Leucauge* (= *Argyropeira*), a genus of common diurnal spiders, whose striking black markings, with or without orange or green on a background of metallic silver, render many of the species exceptionally handsome.

The next subfamily contains the giant *Nephila*, whose immense web of strong yellow silk is a striking feature of all damp jungles during the rains, when it reaches maturity, its term of life being confined apparently to a single year. The legs of a full grown female have a span of about six inches, the body attaining a length of about two inches and a thickness of about three quarters of an inch. The great disparity between the sizes of the two sexes which is noticeable in many spiders, is illustrated in an extreme form in this genus (see fig. 5), the males being relatively insignificant slender little spiders of a reddish brown colour, of which one or more is commonly to be found residing among the outer whorls of the web of the female.

The genus *Argiope*, which gives its name to the whole family, includes the familiar spider with abdomen transversely banded in dark brown and pale yellow, that sits with its legs stretched out in pairs over a "St. Andrew's cross" (not always complete however) of opaque white silk, with which its web is decorated. Males of this species are also relatively minute and live in small webs on the borders of the web of the female: they are of a uniform brownish colour. Very young specimens decorate the centre of their webs with lace-like silk not unlike that found at the centre of the web of *Uloborus geniculatus* (see above).

Members of the genus *Cyrtophora* are remarkable for the extreme complexity of their webs, which are probably more elaborate than those of any other spider. Instead of all the radial strands extending outwards from the hub, with interspaces consequently much wider near the periphery than near the centre, additional strands are inserted so as to produce a web of exceedingly fine and uniform mesh. Nor is this all, for these webs are supported in a horizontal position by an extensive irregular network with the help of which the centre of the circle is more or less greatly raised above the periphery, thus forming a sort of tent or dome. One or two species are very common all over India. Their webs are usually found in groups, the irregular supporting framework of which gives them a most untidy and unattractive appearance; and it is only on closer examination that the exquisitely delicate structure of the circular web is seen. Slender Reduviid bugs, *Eugubinus* spp. feed on the eggs of this spider and are sometimes to be seen making their way about in its webs, which also seem very attractive to certain other species of spiders, mostly belonging to the genera *Argyrodes* and *Uloborus*.

Several species of *Cyclosa* (fig. 6) are to be met with in all parts of the country. The cephalic portion of the carapace is strongly elevated and separated from the lateral and posterior parts by a deep groove, while the abdomen is as a rule ornamented by at least one pair of conical protuberances. The webs frequently have a line of debris extending across one diameter (fig. 6 h), with a gap in the centre which is exactly filled by the spider.

The immense genus *Araneus* (= *Epeira*) includes many common forms, for the most part more or less nocturnal and having the same general form and colouration as the common European garden spider of the same genus. The colour is often variable, the structure of the vulva affording the safest means of identification. Another genus of *Argiopidae*, *Gasteracantha* by name, is remarkable for its hard integuments, drawn out on the sides of the abdomen into spines, often of fantastic appearance and sometimes of astounding length (fig. 7).

The allied family *Theridiidae* contains curious genera resembling *Gasteracantha*, as well as a large number of other genera many of which resemble other *Argyropidae* in general appearance. But their webs are always irregular, never circular. Some species live in a curled up dead leaf or even in a specially constructed shelter in the middle of the web. Several small forms, belonging to the genus *Argyrodes*, live in the webs of larger *Argiopid* spiders, where they are apt to be mistaken by inexperienced collectors for the mates of the rightful owner of the web.

The common Indian house spiders are most useful allies in our attempts to keep down cockroaches, mosquitoes and other noxious insects, and with one or two exceptions should always be welcomed and encouraged to stay. The exceptions are of course those which spin untidy-looking and dust-collecting webs. One of these, *Uloborus geniculatus*, has already been mentioned. But a much more troublesome species is the long legged *Artema atlanta* (fig. 8) which loves to spin untidy cobwebs in any quiet corner of the house, and to rest there upside down with its eggs in its jaws. If it manages to remain till its eggs are hatched a colony will soon be established, for, like the majority of the family *Pholcidae* to which it belongs, it is a spider with strong social instincts.

The large house spider *Heteropoda venatoria* and its allies (family *Clubionidae*) on the contrary spin no webs, beyond neat biscuit-like cocoons around their eggs. They sit flat upon the walls, usually hidden behind pictures and almirahs by day, coming out in search of prey at night. They are often seen in bathrooms and other such places and are unreasonably dreaded by many. In reality they are much to be encouraged. In the commonest species, *H. venatoria*, which is found throughout all tropical countries, the female and young are brown but full grown males are velvety grey and black (fig. 9). Another common



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8. *Artema atlanta* with eggs.

9. *Heteropoda venatoria* ♂.

(From photograph and drawing lent by the Zoological Survey of India).



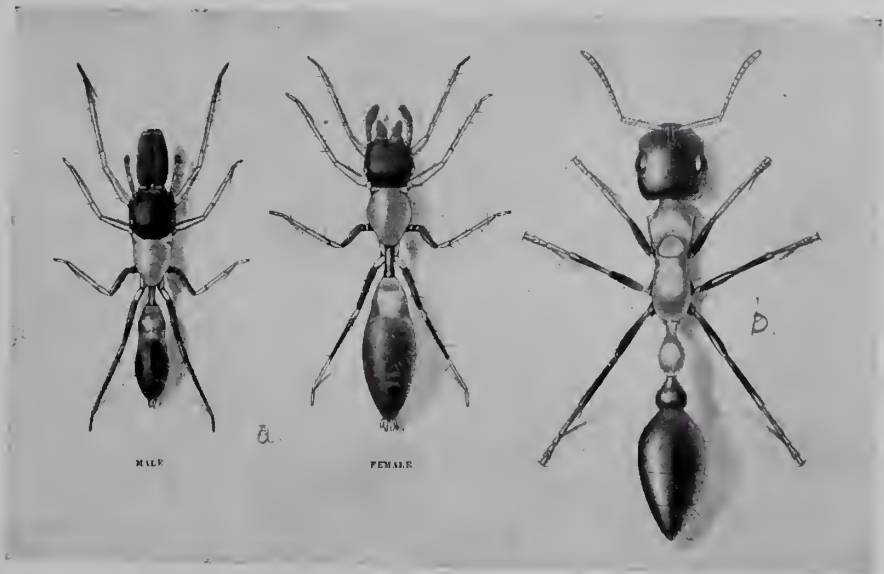




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- 10. *Plexippus paykulli* ♂.
  - 11. *Plexippus paykulli* ♀.
  - 12. *Myrmarachne laetus*, ♂ and ♀ (a) and its model *Sima rufonigra* (b).
- (From drawings lent by the Zoological Survey of India)



and useful, though much smaller, house spider is the little jumping spider *Plexippus* (family *Attidae*), a creature so partial to a diet of mosquitoes that one species has earned for itself the specific name *culicivorus*.

In both *Heteropoda venatoria* and the common *Plexippus* the female is of a dull mottled brown colour, and the male much handsomer. The difference is most marked in *Plexippus* (see figs. 10 & 11) in which the male is not brown at all but strikingly marked with rich black on a whitish ground. I am not aware that anything is known of the courtship of *Heteropoda*.—But among the *Attidae* it is well known that this often includes a dance of the male before the female and I have on more than one occasion seen the male *Plexippus* cautiously approaching his mate with uplifted fore-legs, though the dance does not appear to be so well shown in this species as in some that have been investigated.

The *Attidae* are an immense family, and most of its members are jumping spiders not unlike *Plexippus* in general structure, but of very varied size, proportions and colouration. Some of the smaller species are resplendent with amazingly brilliant metallic colours. One interesting group, however, closely resembles various species of ants in form and mode of progression as well as in colour (see fig. 12). Ant-mimicing spiders are found also in other families, such as the *Clubionidae*, to which the large House spider belongs, and the *Thomisidae* or Crab-spiders; and they form a most interesting study. There are also species which mimic the handsomely coloured wingless female Mutillid wasps. Such spiders can, of course, be at once distinguished from their insect models by the possession of four instead of three pairs of walking legs. The first pair is often held up to look like antennae, but is always attached to the lower surface behind the mouth instead of to the upper surface in front of it.

The majority of the *Thomisidae* (Crab-spiders) are broad bodied with widely spreading legs, not unlike the Large House Spider in general build, but with the two hind pairs of legs much smaller than the two front pairs. One of the commonest species, usually greenish or whitish in colour, hides among leaves or flowers to pounce on such insects as may be tempted to visit them.

Several of the smaller species of *Lycosa* (family *Lycosidae* or Wolf spiders) are usually to be found running about in large numbers on open ground, both wet and dry, especially the former. They are brownish in colour, the males sometimes with conspicuous silvery white palps or front legs; they may readily be recognised from spiders belonging to other families by the arrangement of the eyes, the four posteriors being as a rule of relatively enormous size, the medians directed forwards and the laterals outwards, while the four anterior eyes are quite small, and situated in a line below the posterior medians. One or two much larger species of *Lycosa* live in broad burrows, open at the mouth and lined with loosely spun silk. They are often to be found on open grassy land.

A closely allied genus, *Hippasa*, distinguished from *Lycosa* by having the posterior spinnerettes much longer than the anterior, instead of about equal to them, is the builder of most of the sheet-webs communicating with a tunnel that are commonly to be found spreading out from walls, bushes, grass and other convenient hiding places. The spiders lie in wait for their prey at the mouth of the tunnel; and when mature they appear to live amicably in pairs, the male guarding the mouth of the tunnel while the female rests inside.

The *Lycosidae* carry their eggs in a spherical cocoon attached to the spinnerettes, and the young when hatched mount on the back of the mother and are thus carried about by her for a time.

The *Oxygypidae* are a family of more slender and brightly coloured hunting spiders, with eyes of normal size, and very spiny legs. They hide their cocoons among foliage, where they mount guard over them.

The *Hersiliidae* are much flattened, long legged spiders, with very long pointed spinnerettes (fig. 13). They live on tree trunks and walls, adapting their colour to that of their surroundings, and are very difficult to detect until they are disturbed, when they dart to a new resting place and again become practically invisible. Only one species, *Hersilia savignyi*, appears to be common in India.

In the space of a short article like this it is impossible to do more than indicate something of the habits and systematic position of the spiders most likely to come to the notice of field naturalists in India, and a glance at the "Fauna of British India" or at the "Cambridge Natural History" will show how many whole families have been entirely omitted. I am always glad to enlighten members, so far as I am able, as to any spiders they may find which specially interest them. But in spiders as in so many other groups, the literature is both extensive and difficult and specific identification is more often than not impracticable at present.

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13.

13. *Hersilia savignyi*.  
(From a drawing lent by the Zoological Survey of India.)



